of communicating tubes in which leaky places occurred, that is, as if they (the Italics) existed continuously, or suddenly broke out. Under pressure, this fluid would issue from the leaky places, whilst, under partial vacuum, the stream of liquid would remain itself unbroken and air would be obliged to outer in at the leaky places.

On this ground, the path of the gases in an open-hearth furnace cannot be. compared with a single closed system of communicating tubes, but one must; suppose at least two such systems, the one for the. inlet end and the other for the outlet end, as in tlie preceding calculations. The motion of the gas currents must In*, so directed that the inflowing current and the outflowing current are, about the same weight, and the combustion diamber itself IB the equivalent of a neutral portion that is to say, completely filled by the products of combustion of the gas. "Were one to regard it as possible for tbe ebimney draught to havo some important effect on the conveyance of gas to tbe combustion chamber, it would be impossible to avoid a disturbance of the path of the flame, or even at times its complete disappearance.

The condition for good working of a furnace is, that the driving forces are. suitable for the before-mentioned resistances to the motion of the gas. Therefore, in the design and building of a furnace one must boar in mind that the resistances am confined to tbe smallest feasible proportions ; and this one i,s able to attain by making the dimensions of all Hoc.tions Huflieiently largo so that the gases do not acquire too great velocity, and that, as much as possible, changes of direction of the gas currents are avoided, and, lastly, that the chequers in the regenerator chambers are so disposed that the passage of the gas is obstructed as little as possible and to avoid HUOH which force the gases through tfig^ag lines.

The resistances at the entrance <md are able to be overcome by the correspondingly chosen buoyancy, and apart from this also by admitting the gases under pressure. For the heated gas thin condition is usually fulfilled in modern producers by means of introducing forced air draught at the bottom of the producer, which permits of the gas being put under any desired prcsHure. For the air supply, on the contrary, the